

REMARKS

This amendment responds to the official action mailed on June 9, 2006, which contained an indication of allowable subject matter for claims 8-13, namely for claim 8 and the claims that depend directly or indirectly from claim 8.

Claim 8 was considered allowable if rewritten in independent form including the limitations of the rejected base claim and any intervening claims. Applicant has amended base claim 1 to incorporate the subject matter of claim 8 and intervening claim 7. Therefore, claims 1 and the claims depending from claim 1 are allowable. Claims 7 and 8 have been canceled and the dependency of claim 9 has been moved from claim 8 to claim 1. Claims 1-6 and 9-13 are thus allowable in accordance with the official action.

The remaining claim 14-17 were rejected as anticipated by US Patent 5,879,727 - Puri. These claims have been canceled, without prejudice, and applicant need not comment on the propriety of the rejection respecting these claims.

Claims 18-20 are added. Support can be found throughout the disclosure, including for example, paragraphs 43 – 45 and Figs. 1, 2, 3 and 5. These claims concern aspects of embodiments of the invention wherein thermal conductivity is limited due to one or more structural interruptions in the continuity of the material that is disposed between the end of the tip and the portion spaced longitudinally (axially) back from the end. Claim 18 recites reduced wall thickness and a material gap along the tip, i.e., an opening having an axial and a radial dimension. Claim 19 defines a fin (also defined in claim 9) wherein the material gap includes openings in the fin. As shown and described, the fin can have diametrically opposite webs that provide buttresses to support the nozzle. The claimed openings in the fin facilitate this structure while limiting thermal conduction capacity. (See Figs. 1, 2, 3). In claim 20, the material gap includes a radial groove extending for an axial span that likewise limits thermal conduction capacity (See Fig. 5).

These structural gaps in the material of a nozzle are not disclosed or reasonably suggested by the prior art of record, including the Puri reference. Puri teaches that thermal insulation is desirable but attempts to achieve an insulating effect by interposing an insulating sleeve 76 between the nozzle tip 52 and the gate insert 88. See Puri's Fig. 2. These respective parts are fit together and also are affixed to the nozzle housing 40 by a series of threaded connections, between the tip and the inner and outer sleeves. These include threads 48/56, 68/72 and 80/84. The insulating part in Puri is the insulating sleeve 76. This sleeve 76 abuts against and fills the space between axial faces of the nozzle tip 52 and the gate insert 88. There is no gap in an axial direction comparable to applicant's claimed invention. See Puri at Fig. 1. Puri interposes an insulating sleeve to minimize the extent of thermally conductive contact between nozzle tip 52 and gate insert 88, namely heat flow in a radial direction between inner and outer cylindrical or sleeve-shaped (tubular) parts.

According to applicant's claims 18-20, insulation is provided by structures that have one or more material gaps along the thermal conduction path including a reduced wall thickness and an axially extending gap. Applicant's structures are configured and intended to limit heat conduction in the longitudinal or axial direction, which is unlike Puri, wherein the object is to limit heat conduction in a radial direction between superimposed cylindrical and tubular parts. Applicant has addressed the thermal conduction matter in a way that is different and unobvious from Puri's approach, and avoids the need for multiple threaded-together inner and outer sleeves of materials wherein a dissimilar insulating material occupies a radial position between inner and outer heat conductive parts. Applicant's invention is different from and patentable over Puri.

Puri has various gaps. The gaps can be seen in the cross sectional views, such as the space between the mold plate 28 and the nozzle structures, and the thread clearance provided on both axial ends of the threads 48/56, 68/72 and 80/84. These gaps are not functional as openings that limit thermal conduction in an axial direction because they are minimal-depth axial openings between sleeves that are already in as

intimate a thermally conductive engagement as their materials will permit, by virtue of their threaded engagement over an extended axial distance.

Puri teaches one embodiment wherein a gap is provided between the insulator sleeve 76 and the nozzle tip 52. This embodiment is shown in Fig. 4 and has a gap 112, discussed at Col. 7, lines 18-32. It is unclear in this embodiment whether and/or how the assembly of sleeve 76' and gate insert 88 are kept from falling off of the nozzle tip 52'. Nevertheless, Puri teaches that the gap can contain air or can confine a gas, and the radially facing surfaces can be made reflective. These teachings involve ways to render the thermally insulating sleeve even more insulative against heat conduction in a radial direction along the axial extension of the sleeve. Puri still relies on an assembly wherein thermal conduction is to be limited in a radial direction between assembled tubular and cylindrical elements by including in the assembly a thermally insulating sleeve. In Puri's Fig. 4, the sleeve is simply made even less conductive by the radial space between sleeve 76' and nozzle tip 52'. Puri neither discloses nor suggests applicant's invention wherein thermal conduction is limited by a radial groove extending axially (thereby blocking heat conduction in an axial direction), or by a fin structure that supports the tip and has openings that block conduction in an axial direction through the fins.

Applicant is pleased to note the indication of allowable subject matter now applicable to claims 1-6 and 9-13 and requests that these claims be allowed. Applicant also requests that claims 18-20 also be allowed over Puri. The differences between the invention and the prior art are such that the subject matter claimed as a whole is not found in Puri and the differences are such that the invention as a whole cannot be considered obvious.

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Applicant's Remarks
Response to Action of 06/09/2006

Reconsideration and allowance of claims 1-6, 9-13 and 18-20 are requested.

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Respectfully submitted,

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